

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554**

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| In the Matter of: |) | |
| |) | |
| FCC Bureaus and Offices Seek Public |) | |
| Comment in 2018 Biennial Review of |) | |
| Telecommunications Regulations |) | |
| |) | ET Docket No. 18-370 |
| Office of Engineering and Technology |) | |
| |) | |
| Amending Parts 1 (Section 1.1307 and 1310), |) | |
| 2 (Subparts A, B, I, J and K), 5, 15 and 18. |) | |

COMMENTS OF THE MOBILE & WIRELESS FORUM

The Mobile & Wireless Forum (MWF) is a global trade association of manufacturers committed to addressing, among other things, issues related to RF exposure, including product testing requirements and type approvals worldwide.¹ Accordingly, the MWF is well positioned to comment on the RF exposure standard set out in Part I, Section 1.1310 per the FCC's notice of December 17, 2018.² Moreover, because MWF members are global manufacturers they therefore bring a global perspective to issues related to the RF standard and its application. MWF respectfully submits these comments in the referenced proceeding.

¹ The MWF is an international association of telecommunications equipment manufacturers with an interest in mobile or wireless communications, including the evolution to 5G and the Internet of Things. Established to support research into the health and safety of radio frequency electromagnetic fields, the MWF has worked with national and international health agencies to support research on RF and health. Further information on the MWF can be found on our website (www.mwfai.org).

² DA 18-1260, FCC BUREAUS AND OFFICES SEEK PUBLIC COMMENT IN 2018 BIENNIAL REVIEW OF TELECOMMUNICATIONS REGULATIONS, (Dec. 17, 2018).

MWF has been active in the discussion about the requisite standard and has filed previously on the matter. MWF, therefore, calls attention to and incorporates by this reference its submission of September 7, 2018 regarding the need for FCC to harmonize its RF exposure limits with the updated IEEE and global limits.³ In its earlier filing as well as here, the MWF sought and continues to seek to convey the following clear and urgent reasons FCC should adopt the updated RF exposure standard:

1. The FCC must adopt a science-based standard and not continue to fall back on the 1991 IEEE standard (adopted by the FCC in 1996) which now has been superseded by both the 2005 IEEE standard and the pending 2019 IEEE standard;
2. A standard that is harmonized with the limits used around the world will provide both consumer protection and the best devices for U.S. consumers;
3. Adoption of the updated standard is key to the approval process for millimeter- wave 5G devices.

As explained below, the overriding import of these messages is that it is incumbent upon the FCC to follow through on the effort it began in 2013 with its Notice of Inquiry⁴ about updating its RF exposure limits by going forward with a Notice of Proposed Rulemaking for adoption of the updated limits. Due to both the passage of time and the profound advances in technology, the FCC's regulations are neither current nor adequate. Now is the time for the FCC to update those regulations and enable U.S. consumers and businesses to have a level playing field for approval of new technologies.

³ Notice of Ex Parte submission for ET Docket 13-84

⁴ FCC Docket No. 13-84, Reassessment of Federal Communications Commission Radiofrequency Exposure Limits and Policies (Released March 29, 2013).

I. The FCC Must Adopt a Science-Based Standard

The scientific basis of the 2005 IEEE Standard is reflected in the analysis set out in its voluminous Rationale⁵ and the broad swath of the scientific literature it covers.⁶ It updates the SAR limits and essentially harmonizes them with the 1998 ICNIRP Guidelines.⁷ Moreover, it articulates why it is a superior standard to the earlier 1991 version.

The 2005 IEEE standard brought forward the scientific analysis of the experts on RF exposure and revised the exposure limits accordingly.⁸ Indeed, the IEEE expressly pointed out that the earlier version of C95.1 no longer constituted a relevant basis for an exposure standard and had been supplanted by the later risk assessment:⁹

A.1.3 Complete reassessment of the technical rationale

IEEE Std C95.1-1991 (and the 1999 Edition) was based on research published before 1986. Research has continued since 1986; a reevaluation of the RF biological effects database was therefore performed. A new risk assessment based on the results of this reevaluation was undertaken. Attempts were made to include and to evaluate all of the relevant literature in the database.

⁵ Note 10, *supra*, Annex C at 78-139.

⁶ Note 10, *supra*, Annex F at 152-227.

⁷ Notably, the general public SAR limit was revised from 1.6 W/Kg averaged over one gram of tissue to 2.0 W/Kg averaged over ten grams, and the occupational SAR limit was revised from 8 W/Kg averaged over one gram to 10 W/Kg averaged over ten grams.

⁸ Note 9, *supra* at 4.2.1. Notably, the SAR standard was revised from 1.6 W/Kg averaged over one gram of tissue to 2.0 W/Kg averaged over ten grams of tissue.

⁹ Note 10, *supra*, Annex A.

Given that the FCC's current RF exposure limits are based on research conducted prior to 1986 and that the updated limits are based on updated research, it is clear that the FCC should adopt the superseding limits.

II. The FCC Should Seek to Harmonize Its RF Exposure Requirements with the Global Standard

There are essentially two standards that govern RF exposure: IEEE and ICNIRP. Both standards bodies have arrived at closely congruent standards despite the difference in philosophy behind the makeup of each body – i.e., IEEE has a democratic membership where all qualified professionals¹⁰ can participate while ICNIRP requires that participants certify that they have no conflict of interest with the public good.¹¹ At the present time, each of these standards bodies is engaged in an update of their standard; both are expected to affirm their existing SAR limits and add guidance for millimeter-wave devices (such as 5G devices).

The 2019 updates will mark twenty-one years that the global ICNIRP standard has been in operation and fourteen years that IEEE has been operating with the same SAR levels as

¹⁰ The IEEE website uses the following definition: "Professional membership is open to individuals who by experience give evidence of competence in an IEEE designated field. The designated fields are: Engineering, Computer Sciences and Information Technology, Physical Sciences, Biological and Medical Sciences, Mathematics, Technical Communications, Education, Management, and Law and Policy." <https://www.ieee.org/membership/join/index.html#qualifications-and-dues>.

¹¹ The ICNIRP website states: "The Commission membership consists of a Chairperson, Vice-Chairperson and up to 12 members. Commission members are independent experts in the scientific disciplines relevant to non-ionizing radiation protection (biology, epidemiology, physics, bio-physics, medicine). In carrying out their voluntary work for the Commission they do not represent either their countries of origin or their institutes. ICNIRP members are required to declare any personal interests in relation to their activities for ICNIRP. Members' declarations of personal interests are available below along the member's profile." www.icnirp.com.

ICNIRP. Despite the duration of operation under ICNIRP and lengthy period of a consensus standard, the FCC has not revised its RF exposure requirements since 1996. Given the state of the science and the long global experience with the updated SAR levels, MWF believes that FCC should now revise its standard and thereby enable the improved connectivity that the rest of the world enjoys.¹² Moreover, given that maintenance of the current regulations will continue to impose uncompetitive limits on 5G technology vis-a-vis the rest of the world, the adoption of an updated standard is not only in keeping with the FCC's initiative for U.S. leadership in 5G but is driven by it.

III. The RF Exposure Standard Must Be Updated to Provide Meaningful Guidance for Approval of 5G Devices

Technology has advanced substantially since the FCC's 2013 Notice of Inquiry (NOI) regarding the RF exposure guidelines.¹³ The exposure guidelines currently referenced in the CFR (ANSI/IEEE Std C95.1-1992¹⁴ and NCRP Report No. 86 -1986¹⁵) were developed based on contemporary science and eventually adopted by the FCC in 1996¹⁶ to be applied, amongst

¹² MWF understands that FCC is dependent upon FDA and the Intra-Governmental Working Group of guidance on the exposure standard and is aware of no objection from the health agencies that would impede adoption of a harmonized standard.

¹³ FCC Docket No. 13-84, Reassessment of Federal Communications Commission Radiofrequency Exposure Limits and Policies (Released March 29, 2013).

¹⁴ ANSI/IEEE Std. C95.1, *IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz* (1992).

¹⁵ National Council on Radiation Protection and Measurements. *Biological Effects and Exposure Criteria for Radiofrequency Electromagnetic Fields*. NCRP Report No. 86 (1986).

¹⁶ See Report and Order, ET Docket 93-62, FCC 96-326, adopted August 1, 1996, 61 Federal Register 41006, 11 FCC Rcd 15123 (1997). The FCC initiated this rule-making proceeding in 1993 in response to the 1992 revision by ANSI of its earlier guidelines for human exposure.

other things, to First (1G) and Second Generation (2G) devices. Third Generation (3G) devices and networks long since have given way to Fourth Generation (4G) devices and networks. Fifth Generation (5G) devices and networks with increased bandwidth and ubiquitous usage for the Internet of Things stand on the cusp. Meanwhile, evolving scientific knowledge led to the 1998 ICNIRP Guidelines¹⁷ and the 2005 IEEE Standard revision¹⁸, which included substantially different SAR metrics and associated limits that supersede the earlier limits. Indeed, it should be underscored that the SAR metrics and limits by NCRP were never reaffirmed and thus clearly became outdated after the subsequent scientific reviews leading to ICNIRP 1998 and then IEEE 2005.

With the advent of 5G technology and millimeter wave 5G devices, the need to update the standard has now reached urgent proportions. The industry's ability to deliver devices to fulfill the promise of 5G is at risk and will be significantly curtailed if the FCC continues to utilize regulations based on the 1991 C95.1 standard. Devices planned for 2019¹⁹ will need to utilize the full parameters of the millimeter-wave specific guidance set out in the pending 2019 IEEE Standard in order to offer optimum 5G performance.²⁰

¹⁷ *ICNIRP Guidelines for Limiting Exposure to Time-Varying Electric, Magnetic and Electromagnetic Fields (up to 300 GHz)*. Health Physics; 74 (4):494-522; 1998.

¹⁸ IEEE-SA Standards Board, IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz (2005)

¹⁹ Companies have announced they are working on mobile 5G devices and are targeting 2019. See, e.g., "Verizon 's First 5G Mobile Device. It's A Snap", <https://www.lightreading.com/mobile/5g/verizons-first-5g-mobile-device-its-a-snap!/d/d-id/745125> (Aug. 2, 2018); "Sprint and LG Will Release a Smartphone in the First Half of 2019" <https://www.theverge.com/circuitbreaker/2018/8/14/17689028/sprint-lg-5g-smartphone-early-2019-announcement-mobile-networking> (August 14, 2018).

²⁰ See note 14 *infra* for such guidance in the ICNIRP Draft Guidelines. Per the participants in the IEEE proceeding, the IEEE standard will contain similar provisions.

CONCLUSION

The FCC's existing RF exposure regulations have been superseded by updated science and adopted exposure limits. The principled position for FCC take is to adopt the adopted standard rather than continue to base approvals on the 1991 IEEE standard, now twenty-eight years old. The U.S. should have science-driven regulations and not operate under science and limits that are outdated and have been superseded.

Adoption of the updated standard will result in harmonizing the U.S. exposure limits with those used in most countries around the world, including those operating under the ICNIRP standard such as the EU countries. Harmonization provides the benefits of internationally accepted standards as well as improved connectivity for U.S. customers who now operate under unnecessarily restrictive limits.

Further, it should be noted that the current 2005 IEEE standard now is close to being superseded by the 2019 IEEE standard, which soon will be published. This will be a state of the art version of the standard that will address the exposure limits for millimeter-wave 5G devices and, therefore, will be essential for development of a robust 5G marketplace. Importantly, it will align with the pending ICNIRP standard, also expected to be published in 2019 and to address exposure limits for millimeter-wave devices. Both updated standards will define suitable exposure metrics and limits for such devices and thereby provide meaningful templates for updating FCC requirements.

In sum, the FCC should take the opportunity of the 2018 Biennial Review to issue a NPRM for updating its RF exposure guidelines to adopt the upcoming 2019 IEEE standard.

Respectfully Submitted,

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